Name: Date:

Polynomial Factoring solution (version 697)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 10x + 36 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(10) \pm \sqrt{(10)^2 - 4(1)(36)}}{2(1)}$$

$$x = \frac{-(10) \pm \sqrt{100 - 144}}{2(1)}$$

$$x = \frac{-10 \pm \sqrt{-44}}{2}$$

$$x = \frac{-10 \pm \sqrt{-4 \cdot 11}}{2}$$

$$x = \frac{-10 \pm 2\sqrt{11}\, i}{2}$$

$$x = -5 \pm \sqrt{11}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $6 - 3i$ and $7 - 4i$ in standard form ($a + bi$).**

Solution

$$(6 - 3i) \cdot (7 - 4i)$$

$$42 - 24i - 21i + 12i^2$$

$$42 - 24i - 21i - 12$$

$$42 - 12 - 24i - 21i$$

$$30 - 45i$$

Polynomial Factoring solution (version 697)

3. **Write function $f(x) = x^3 + x^2 - 30x - 72$ in factored form. I'll give you a hint: one factor is $(x + 3)$.**

Solution

	1	1	-30	-72
-3		-3	6	72
	1	-2	-24	0

$$f(x) = (x+3)(x^2 - 2x - 24)$$

$$f(x) = (x+3)(x+4)(x-6)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+6) \cdot (x+3) \cdot (x-2)^2 \cdot (x-6)^2$$

Sketch a graph of polynomial $y = p(x)$.